



west virginia department of environmental protection

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ENGINEERING EVALUATION / FACT SHEET

BACKGROUND INFORMATION

Application No.: R13-3172
Plant ID No.: 103-00078
Applicant: Stone Energy Corporation (Stone)
Facility Name: Mills Wetzel Pad No. 1
Location: Jacksonburg, Wetzel County
NAICS Code: 211111
Application Type: Construction (After the Fact)
Received Date: February 4, 2014
Engineer Assigned: Jerry Williams, P.E.
Fee Amount: \$3,500.00
Date Received: February 4, 2014
Complete Date: April 28, 2014
Due Date: July 27, 2014
Applicant Ad Date: February 12, 2014
Newspaper: *Wetzel Chronicle*
UTM's: Easting: 528.035 km Northing: 4,375.376 km Zone: 17
Description: This permitting action is for the 'after the fact' construction permit for a natural gas production facility.

DESCRIPTION OF PROCESS

The following process description was taken from Permit Application R13-3172:

Natural gas and produced fluids (aqueous and organic) are collected from seven (7) non-conventional horizontal wells located onsite with a flowing tubing pressure around 500 psig. Four (4) of the wells flow gas through individual gas processing units (GPUs). These GPUs consist of a 0.75 million British Thermal Units per hour (MMBTU/hr) line heater connected to a three phase separator. Three (3) of the wells use individual 0.5 MMBTU/hr line heaters and a standalone three phase separator. As a result of the three (3) wells using a combined separator, the need arises to periodically quantify the amount of liquids being recovered from each well. This is accomplished by periodically diverting one (1) of the wells to a fifth GPU to allow individual measurement for a short period of time. The metering GPU utilizes a 0.5 MMBTU/hr heater and a three phase separator.

Promoting a healthy environment.

In general, the well stream requires heating due to pressure reductions experienced by choking the stream down to the sales line pressure, typically 400 psig. In the separator, the well stream is divided into sales gas and its associated liquids (water and condensate). The gas phase leaves the separator and is routed to a 7 million standard cubic feet per day (mmscfd) triethylene glycol (TEG) dehydration unit for removal of any excess water prior to being introduced to the sales line. Any liquids that are condensed while exiting the still vent are routed to a 500 gallon storage tank located beside the dehydration unit. The liquids removed by the three phase separator are allowed to settle and are further separated by gravity into the lighter organic fraction and the heavier aqueous water phase. The aqueous produced water stream is routed to one (1) of two (2) 210 barrel (bbl) tanks. The organic condensate fraction is stored in a single 210 bbl tank. In order to reduce VOC emissions, the condensate storage tank is controlled by a flare. The tank's contents are hauled away by 80 bbl trucks.

SITE INSPECTION

A site inspection was conducted at another Stone well pad site by Jamie Jarrett of the DAQ Enforcement Section on February 23, 2013. It was determined that there was equipment installed and operating at the site that was not permitted. Through further investigation by the DAQ, it was discovered that the Mills Wetzel Pad No. 1 was also being operated that was not permitted. The DAQ and Stone entered into a Consent Order on November 6, 2013, requiring Stone to obtain all necessary air permits.

The Mills Wetzel Pad No. 1 was inspected on February 27, 2014 by Doug Hammell of the DAQ Enforcement Section. According to Mr. Hammell, the site location is appropriate for the proposed facility. The closest residence is approximately 4,000 feet away.

Latitude: 39.5276
Longitude: -80.6738

Directions to the proposed facility are as follows:

From Jacksonburg: Travel south on Buffalo Run Road for 0.2 miles. Stay left on Buffalo Run Road at the intersection. Travel 0.8 miles and turn right onto unnamed lease road. Travel 1.75 miles to an intersection on the lease road. Turn right and travel 0.95 miles. The site is located on the right.



ESTIMATE OF EMISSIONS BY REVIEWING ENGINEER

Emissions associated with this construction application consist of the emissions from five (5) GPUs (GPU-1, GPU-2, GPU-3, GPU-4, GPU-5), three (3) line heaters (LH-1, LH-2, LH-3), one (1) TEG dehydration unit (RSV-1), one (1) TEG reboiler (RBV-1), four (4) storage tanks (T01, T02, T03, T04), one (1) flare (F01), one (1) truck loadout (TL01), and fugitive emissions.

The following table indicates which methodology was used in the emissions determination:

Emission Unit ID#	Process Equipment	Calculation Methodology
RSV-1	7.0 mmscfd Glycol Dehydration Unit Still Vent	GRI GlyCalc 4.0
RBV-1	1.0 MMBTU/hr Glycol Dehydration Unit Reboiler	EPA AP-42 Emission Factors
GPU-1 – GPU-5	0.75 MMBTU/hr Gas Processing Units (GPU1-4) 0.50 MMBTU/hr Gas Processing Units (GPU-5)	EPA AP-42 Emission Factors
LH-1 – LH-3	0.5 MMBTU/hr Line Heaters	EPA AP-42 Emission Factors
T01 – T04	8,820 gal (210 bbl) Produced Water Tanks (T01, T02) 8,820 gal (210 bbl) Condensate Tank (T01, T03) 500 gal Mixed Liquids Tank (T04)	Tanks 4.0 (Working/Breathing) and GOR Method (Flashing)
F01	Flare	EPA AP-42 Emission Factors (HAPCalc)
TL01	Liquids Loading Rack (3,357 gal/day)	EPA AP-42 Emission Factors

Fugitive emissions for the facility are based on calculation methodologies presented in 40CFR98 Subpart W. 40CFR98 Subpart W is the greenhouse gas reporting tool for the natural gas industry.

The following table indicates the control device efficiencies that are required for this facility:

Emission Unit	Pollutant	Control Device	Control Efficiency
Condensate Storage Tank (T03)	Volatile Organic Compounds	Flare	98 %
	Total HAPs		98 %

Stone shall install, maintain, and operate all above-ground piping, valves, pumps, etc. that service lines in the transport of potential sources of regulated air pollutants to prevent any substantive fugitive escape of regulated air pollutants. Any above-ground piping, valves, pumps, etc. that shows signs of excess wear and that have a reasonable potential for substantive fugitive emissions of regulated air pollutants shall be replaced. Stone shall not exceed the number and type of components (valves, pump seals, connectors, etc.) in gas/vapor or light liquid (as applicable) listed on the following page:

Equipment	Valves	Connectors	Open-ended Lines	Pressure Relief Valves
Wellheads	8	38	0.5	0
Separators	1	6	0	0
Meters/Piping	12	45	0	0
Compressors	12	57	0	0
In-line Heaters	14	65	2	1
Dehydrators	24	90	2	2
Total	71	301	4.5	3

The total facility potential to emit (PTE) for the Mills Wetzel Pad No. 1 is shown in the following table:

Pollutant	Facility Wide PTE (tons/year)
Nitrogen Oxides	5.22
Carbon Monoxide	17.52
Volatile Organic Compounds	57.35
Particulate Matter-10/2.5	0.18
Sulfur Dioxide	0.95
Total HAPs	11.50
Carbon Dioxide Equivalent	9,474

Maximum detailed controlled point source emissions were calculated by Stone and checked for accuracy by the writer and are summarized in the table on the next page.

Stone Energy Corporation – Mills Wetzel Pad No. 1 Natural Gas Production Site (R13-3172)

Emission	Source	NO _x		CO		VOC		PM		SO ₂		Total HAPs		CO ₂ e
Point ID#		lb/hr	ton/year	lb/hr	ton/year	lb/hr	ton/year	lb/hr	ton/year	lb/hr	ton/year	lb/hr	ton/year	ton/year
1E	Dehydration Unit Still Vent	0.00	0.00	0.00	0.00	9.52	41.68	0.00	0.00	0.00	0.00	2.33	10.03	1085
2E	Dehydration Unit Reboiler	0.05	0.22	0.04	0.18	<0.01	0.01	<0.01	0.02	<0.01	<0.01	<0.01	<0.01	256
3E	Gas Processing Unit	0.07	0.32	0.06	0.27	<0.01	0.02	<0.01	0.03	<0.01	<0.01	<0.01	<0.01	384
4E	Gas Processing Unit	0.07	0.32	0.06	0.27	<0.01	0.02	<0.01	0.03	<0.01	<0.01	<0.01	<0.01	384
5E	Gas Processing Unit	0.07	0.32	0.06	0.27	<0.01	0.02	<0.01	0.03	<0.01	<0.01	<0.01	<0.01	384
6E	Gas Processing Unit	0.07	0.32	0.06	0.27	<0.01	0.02	<0.01	0.03	<0.01	<0.01	<0.01	<0.01	384
7E	Gas Processing Unit	0.05	0.22	0.04	0.10	<0.01	0.01	<0.01	0.02	<0.01	<0.01	<0.01	<0.01	256
8E	Line Heater	0.05	0.22	0.04	0.10	<0.01	0.01	<0.01	0.02	<0.01	<0.01	<0.01	<0.01	256
9E	Line Heater	0.05	0.22	0.04	0.10	<0.01	0.01	<0.01	0.02	<0.01	<0.01	<0.01	<0.01	256
10E	Line Heater	0.05	0.22	0.04	0.10	<0.01	0.01	<0.01	0.02	<0.01	<0.01	<0.01	<0.01	256
11E	Produced Water Tank	-	-	-	-	0.02	0.11	-	-	-	-	<0.01	<0.01	-
12E	Produced Water Tank	-	-	-	-	0.02	0.11	-	-	-	-	<0.01	<0.01	-
NA	Condensate Tank	-	-	-	-	1.04	4.57	-	-	-	-	<0.01	<0.01	-
14E	Pipeline Fluids Tank	-	-	-	-	<0.01	0.02	-	-	-	-	<0.01	<0.01	-
13E	Flare	0.65	2.86	3.55	15.53	1.34	5.88	ND	ND	0.22	0.94	0.30	1.31	5550
15E	Truck Loadout	-	-	-	-	0.29	1.28	-	-	-	-	<0.01	<0.01	-
Fugitive	Fugitive Emissions	-	-	-	-	0.82	3.58	-	-	-	-	0.02	0.07	19
Total	Total Facility PTE	1.19	5.22	4.00	17.52	13.09	57.35	0.04	0.18	0.22	0.95	2.65	11.50	9474

REGULATORY APPLICABILITY

The following rules apply to the facility:

45CSR2 (Particulate Air Pollution from Combustion of Fuel in Indirect Heat Exchangers)

The purpose of 45CSR2 (Particulate Air Pollution from Combustion of Fuel in Indirect Heat Exchangers) is to establish emission limitations for smoke and particulate matter which are discharged from fuel burning units.

45CSR2 states that any fuel burning unit that has a heat input under ten (10) million B.T.U.'s per hour is exempt from sections 4 (weight emission standard), 5 (control of fugitive particulate matter), 6 (registration), 8 (testing, monitoring, recordkeeping, reporting) and 9 (startups, shutdowns, malfunctions). However, failure to attain acceptable air quality in parts of some urban areas may require the mandatory control of these sources at a later date.

The individual heat input of the proposed fuel burning units (RBV-1, GPU-1, GPU-2, GPU-3, GPU-4, GPU-5, LH-1, LH-2, LH-3) are below 10 MMBTU/hr. Therefore, these units are exempt from the aforementioned sections of 45CSR2. However, Stone is subject to the opacity requirements in 45CSR2, which is 10% opacity based on a six minute block average.

45CSR6 (To Prevent and Control Air Pollution from the Combustion of Refuse)

The purpose of this rule is to prevent and control air pollution from combustion of refuse.

Stone has one (1) flare at the Mills Wetzel site. The flare is subject to section 4, emission standards for incinerators. The flare is a smokeless flare and has negligible particulate matter emissions. Therefore, the facility's flare should demonstrate compliance with this section. The facility will demonstrate compliance by maintaining records of the amount of natural gas consumed by the flare and the hours of operation. The facility will also monitor the flame of the flare and record any malfunctions that may cause no flame to be present during operation.

45CSR10 (To Prevent and Control Air Pollution from the Emissions of Sulfur Oxides)

45CSR10 states that any fuel burning unit that has a heat input under ten (10) million B.T.U.'s per hour is exempt from sections 3 (weight emission standard), 6 (registration), 7 (permits), and 8 (testing, monitoring, recordkeeping, reporting). However, failure to attain acceptable air quality in parts of some urban areas may require the mandatory control of these sources at a later date.

The individual heat input of the proposed fuel burning units (RBV-1, GPU-1, GPU-2, GPU-3, GPU-4, GPU-5, LH-1, LH-2, LH-3) are below 10 MMBTU/hr. Therefore, these units are exempt from the aforementioned sections of 45CSR10.

45CSR13 (Permits for Construction, Modification, Relocation and Operation of Stationary Sources of Air Pollutants, Notification Requirements, Administrative Updates, Temporary Permits, General Permits, and Procedures for Evaluation)

45CSR13 applies to this source due to the fact that Stone exceeds the regulatory emission threshold for criteria pollutants of 6 lb/hr and 10 ton/year, and they are also subject to a substantive requirement of an emission control rule promulgated by the Secretary (40CFR63 Subpart HH).

Stone paid the appropriate application fee and published the required legal advertisement for a construction permit application.

45CSR22 (Air Quality Management Fee Program)

This facility is a minor source and not subject to 45CSR30. Stone is required to keep their Certificate to Operate current.

40CFR63 Subpart HH (National Emission Standards for Hazardous Air Pollutants for Oil and Natural Gas Production Facilities)

Subpart HH establishes national emission limitations and operating limitations for HAPs emitted from oil and natural gas production facilities located at major and area sources of HAP emissions. The glycol dehydration unit at the Mills Wetzel pad is subject to the area source requirements for glycol dehydration units. However, because the facility is an area source of HAP emissions and the actual average benzene emissions from the glycol dehydration unit is below 0.90 megagram per year (1.0 tons/year) it is exempt from all requirements of Subpart HH except to maintain records of actual average flowrate of natural gas to demonstrate a continuous exemption status.

The following rules do not apply to the facility:

40CFR60 Subpart Kb (Standards of Performance for VOC Liquid Storage Vessels)

40CFR60 Subpart Kb does not apply to storage vessels with a capacity less than 75 cubic meters. The tanks that Stone has proposed to install are 33.39 cubic meters each. Therefore, Stone would not be subject to this rule.

40CFR60 Subpart OOOO (Standards of Performance for Crude Oil and Natural Gas Production, Transmission and Distribution)

EPA published in the Federal Register new source performance standards (NSPS) and air toxics rules for the oil and gas sector on August 16, 2012. 40CFR60 Subpart OOOO establishes emission standards and compliance schedules for the control of volatile organic compounds (VOC) and sulfur dioxide (SO₂) emissions from affected facilities that commence construction, modification or reconstruction after August 23, 2011. The Mills Wetzel Pad No. 1 commenced construction in May 2011, therefore Stone is not subject to 40CFR60 Subpart OOOO.

40CFR60 Subpart KKK (Standards of Performance for Equipment Leaks of VOC from Onshore Natural Gas Processing Plants)

40CFR60 Subpart KKK applies to onshore natural gas processing plants that commenced construction after January 20, 1984, and on or Before August 23, 2011. The Mills Wetzel site is not a natural gas processing plant, therefore, Stone is not subject to this rule.

45CSR14 (Permits for Construction and Major Modification of Major Stationary Sources of Air Pollutants)

45CSR19 (Permits for Construction and Major Modification of Major Stationary Sources of Air Pollution which Cause or Contribute to Nonattainment)

The Mills Wetzel site is located in Wetzel County, which is an attainment county for all criteria pollutants, therefore the Mills Wetzel site is not applicable to 45CSR19.

As shown in the table below, Stone is not subject to 45CSR14 or 45CSR19 review.

Pollutant	PSD (45CSR14) Threshold (tpy)	NANSR (45CSR19) Threshold (tpy)	Mills Wetzel Pad No. 1 PTE (tpy)	45CSR14 or 45CSR19 Review Required?
Carbon Monoxide	250	NA	17.52	No
Nitrogen Oxides	250	NA	5.22	No
Sulfur Dioxide	250	NA	0.95	No
Particulate Matter 2.5	250	NA	0.18	No
Ozone (VOC)	250	NA	57.35	No
Greenhouse Gas (CO ₂ e)	100,000	NA	9,474	No

TOXICITY OF NON-CRITERIA REGULATED POLLUTANTS

The majority of non-criteria regulated pollutants fall under the definition of HAPs which, with some revision since, were 188 compounds identified under Section 112(b) of the Clean Air Act (CAA) as pollutants or groups of pollutants that EPA knows or suspects may cause cancer or other serious human health effects. Stone included the following HAPs as emitted in substantive amounts in their emissions estimate: Benzene, Ethylbenzene, Formaldehyde, Toluene, and Xylene. The following table lists each HAP's carcinogenic risk (as based on analysis provided in the Integrated Risk Information System (IRIS)):

HAPs	Type	Known/Suspected Carcinogen	Classification
Formaldehyde	VOC	Yes	Category B1 - Probable Human Carcinogen
Benzene	VOC	Yes	Category A - Known Human Carcinogen
Ethylbenzene	VOC	No	Inadequate Data
Toluene	VOC	No	Inadequate Data
Xylenes	VOC	No	Inadequate Data

All HAPs have other non-carcinogenic chronic and acute effects. These adverse health effects may be associated with a wide range of ambient concentrations and exposure times and are influenced by source-specific characteristics such as emission rates and local meteorological conditions. Health impacts are also dependent on multiple factors that affect variability in humans such as genetics, age, health status (e.g., the presence of pre-existing disease) and lifestyle. As stated previously, *there are no federal or state ambient air quality standards for these specific chemicals*. For a complete discussion of the known health effects of each compound refer to the IRIS database located at www.epa.gov/iris.

AIR QUALITY IMPACT ANALYSIS

Modeling was not required of this source due to the fact that the facility is not subject to 45CSR14 (Permits for Construction and Major Modification of Major Stationary Sources of Air Pollutants) as seen in the table listed in the Regulatory Discussion Section.

SOURCE AGGREGATION

“Building, structure, facility, or installation” is defined as all the pollutant emitting activities which belong to the same industrial grouping, are located on one or more contiguous and adjacent properties, and are under the control of the same person. The Mills Wetzel Well Pad is located in Wetzel County and will be operated by Stone.

1. The Mills Wetzel Well Pad will operate under SIC code 1311 (Crude Petroleum and Natural Gas Extraction). There are surrounding wells and compressor stations operated by Stone that share the same two-digit major SIC code of 13 for oil and gas exploration and production. Therefore, the Mills Wetzel Well Pad does share the same SIC code as the wells and surrounding compressor stations.
2. “Contiguous or Adjacent” determinations are made on a case by case basis. These determinations are proximity based, and it is important to focus on this and whether or not it meets the common sense notion of a plant. The terms “contiguous” or “adjacent” are not defined by USEPA. Contiguous has a dictionary definition of being in actual contact; touching along a boundary or at a point. Adjacent has a dictionary definition of not distant; nearby; having a common endpoint or border.

This facility has the ability to transfer its products via pipeline to a Eureka Hunter compressor station or Dominion’s Hastings extraction plant. Neither of these facilities are on contiguous or adjacent property with the Mills Wetzel Well Pad.

3. Stone is the sole operator of the Mills Wetzel Well Pad. There are no support and/or dependency relationships between the midstream companies and Stone Energy.

The Mills Wetzel Well Pad does share the same industrial grouping with other nearby facilities. However, the facilities in question are not under common control or located on contiguous or adjacent properties. Therefore, the emissions from these two (2) facilities should not be aggregated in determining major source or PSD status.

MONITORING OF OPERATIONS

Stone will be required to perform the following monitoring associated with this permit application:

- Monitor and record quantity of natural gas consumed for all combustion sources.
- Monitor the presence of the flare pilot flame with a thermocouple or equivalent.
- Monitor opacity from all fuel burning units.
- Monitor the condensate tank to ensure that all vapors are sent to flare.

Stone will be required to perform the following recordkeeping associated with this modification application:

- Maintain records of the amount of natural gas consumed in each combustion source.
- Maintain records of testing conducted in accordance with the permit. Said records shall be maintained on-site or in a readily accessible off-site location
- Maintain the corresponding records specified by the on-going monitoring requirements of and testing requirements of the permit.
- Maintain records of the visible emission opacity tests conducted per the permit.
- Maintain a record of all PTE HAP calculations for the entire facility.
- The records shall be maintained on site or in a readily available off-site location maintained by Stone for a period of five (5) years.
- Monitor the condensate tank to ensure that the tanks vapors will be sent to flare.
- Monitor the storage tanks and truck loadout throughput.

RECOMMENDATION TO DIRECTOR

The information provided in the permit application indicates Stone's Mills Wetzel Pad No. 1 meets all the requirements of applicable regulations. Therefore, impact on the surrounding area should be minimized and it is recommended that the Wetzel County location should be granted a 45CSR13 construction permit for this proposed permitting action.

Jerry Williams, P.E.
Engineer

Date